Docket No.: **K-0789** PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCE

In re Application of:		Confirmation No.:	**7608**
Sang Ik LEE, Bong Jun CHOI, Jong Min SIN, Youngsam JEON, Jae Seong SIM and Young JEONG		Group Art Unit:	**3744**
Serial No.:	**10/574,656**	Examiner:	**Azim RAHIM**
Filed:	**April 4, 2006**	Customer No.:	**34610**

For: **DEFROSTER FOR EVAPORATOR IN REFRIGERATOR**

APPEAL BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop Appeal Brief-Patents
Randolph Building
401 Dulany Street
Alexandria, Virginia 223134

Sir:

This appeal is taken from the rejection of claims 1, 4-20, and 24-25 as set forth in the Final Office Action dated February 2, 2011 (hereinafter the "Final Office Action"). In accordance with 37 C.F.R. §41.37, Applicants address the following items.

REAL PARTY IN INTEREST

The real party in interest is the assignee, LG Electronics Inc. The assignment document is recorded at Reel ___ and Frame ___.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF THE CLAIMS

This is an appeal from the final rejection dated February 2, 2011 of claims 1, 4-20, and 24-25. No other claims are pending. Claims 2-3, and 21-23 were previously canceled.

STATUS OF AMENDMENTS

All Amendments filed in this application have been entered. A copy of appealed claims 1, 4-20, and 24-25 appears in the attached Claims Appendix.

SUMMARY OF THE CLAIMED SUBJECT MATTER

As stated in 37 C.F.R §41.37(c)(v), Applicants are providing the following explanation of each of the independent claims, independent claims 1 and 12, involved in this appeal. This explanation refers to the specification and drawings. The following is merely an example summary and is not intended to be a discussion of the full and entire scope of the claims. Other interpretations, configurations and embodiments are also within the scope of the pending claims.

Independent Claim 1

Independent claim 1 recites a refrigerator, comprising a cold air duct configured to receive cold air circulating inside of a refrigerating chamber and/or a freezing chamber; an

evaporator in the cold air duct; at least one defrosting heater in the cold air duct configured to selectively emit heat; a fan in the cold air duct that selectively directs the cold air in an upward or downward direction; a motor that drives the fan; and an open/close device that selectively opens and closes a space containing the evaporator, the defrosting heater, and the fan positioned therein. The space communicates with both the refrigerating chamber and the freezing chamber. Further, the open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously. Furthermore, the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space.

Additionally, the first and second open/close parts each comprises a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively, and a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle. Each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates. Also, the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously. The plurality of rotating plates

of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

Referring, for example, to the exemplary embodiment shown in Figures 3-16 of the present application and the corresponding disclosure, Figure 3, for example, shows a refrigerator including a cold air duct 500 configured to receive cold air circulating inside of a refrigerating chamber 111 and/or a freezing chamber 110; an evaporator 200 in the cold air duct 500; a defrost heater 300 in the cold air duct 500; a fan 600 in the cold air duct 500; a fan motor 610; and an open/close device 700, 800 that selectively opens and closes a space containing the evaporator 200, the defrost heater 300, and the fan 600, the space communicating with both the refrigerating chamber 111 and the freezing chamber 110. See, for example, Figure 3 and page 8, line 20-page 8, line 22 of the present application. The open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan 600 so that the opening or closing between the space and the refrigerating chamber 111 and the space and the freezing chamber 110 are performed by the open/close device 700/800 simultaneously. See, for example, page 8, lines 23-page 9, line 4 and page 9, lines 17-25 of the present application.

The open/close device 700/800 includes a first open/close part 700 on an upper side of the space and a second open/close part 800 on a lower side of the space. The first and second open/close parts 700, 800 each include a support plate 710, 810 having a plurality of openings

720, 820 and a plurality of rotating plates 730, 830. The plurality of rotating plates 730, 830 are each coupled to the supporting plate 710, 810 by a hinge 730a, 830a. See, for example, Figures 3-5 and page 8, line 10 through page 10, line 3 of the present application. The plurality of rotating plates 730 of the first open/close part 700 is configured to rotate upwardly in a direction opposite to a location of the fan 600 and the plurality of rotating plates 830 of the second open/close part 800 is configured to rotate upwardly in a direction toward the location of the fan 600 when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber 111 and the freezing chamber 110 simultaneously. See, for example, Figure 4 of the present application and the corresponding disclosure. Further, the plurality of rotating plates 730 of the first open/close part 700 is configured to rotate downwardly toward the location of the fan 600 and the plurality of rotating plates 830 of the second open/close part 800 is configured to rotate downwardly in a direction opposite to the location of the fan 600 when the air is directed downwardly by the fan 600 during the defrosting so that the space is prevented from communicating with the refrigerating chamber 110 and the freezing chamber 111 simultaneously. See, for example, Figure 5 of the present application and the corresponding disclosure.

Independent Claim 12

Independent claim 12 recites a refrigerator, comprising a cold air duct configured to receive cold air circulating inside of a refrigerating chamber and a freezing chamber; an evaporator disposed in the cold air duct, the evaporator comprising at least one refrigerant pipe

configured to receive a refrigerant that flows therethrough, and a plurality of fins in contact with the at least one refrigerant pipe; at least one defrosting heater in contact with one or more of the plurality of fins for selective emission of heat; an open/close device provided at an upper portion and a lower portion of a space containing the evaporator and the defrosting heater positioned therein, that opens and closes the space; a fan in the space that selectively directs the cold air in an upward or downward direction; and a motor that drives the fan. The space communicates with both the refrigerating chamber and the freezing chamber. Further, the open/close device is configured to be rotated so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously. Furthermore, the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space.

The first and second open/close parts each comprises a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively, and a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle. Each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates. Also, the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the

fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously. The plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

Referring, for example, to the exemplary embodiment shown in Figures 3-16 of the present application and the corresponding disclosure, Figure 3, for example, shows a refrigerator including a cold air duct 500 configured to receive cold air circulating inside of a refrigerating chamber 111 and/or a freezing chamber 110; an evaporator 200 in the cold air duct 500, the evaporator 200 including a refrigerant pipe 41, and a plurality of fins 42 in contact with the refrigerant pipe 41; a defrost heather 350 in contact with at least one of the plurality of fins 42; an open/close device 700, 800 provided at an upper portion and a lower portion of a space containing the evaporator 200 and the defrosting heater 350, that opens and closes the space; a fan 600 in the space; and a motor 610, the space communicating with both the refrigerating chamber 111 and the freezing chamber 110. See, for example, Figure 3 and page 8, line 20-page 8, line 22 of the present application. See also, for example, Figure 8 and page 12, line 19-page 13, line 15 of the present application. The open/close device 700, 800 is configured to be rotated so that the opening or closing between the space and the refrigerating chamber 111 and the space and the freezing chamber 110 are performed by the open/close device 700/800

simultaneously. See, for example, page 8, lines 23-page 9, line 4 and page 9, lines 17-25 of the present application.

The open close device 700/800 includes a first open/close part 700 on an upper side of the space and a second open/close part 800 on a lower side of the space. The first and second open close parts 700, 800 each include a support plate 710, 810 having a plurality of openings 720, 820 and a plurality of rotating plates 730, 830. The plurality of rotating plates 730, 830 are each coupled to the supporting plate 710, 810 by a hinge 730a, 830a. See, for example, Figures 3-5 and page 8, line 10 through page 10, line 3 of the present application. The plurality of rotating plates 730 of the first open/close part 700 is configured to rotate upwardly in a direction opposite to a location of the fan 600 and the plurality of rotating plates 830 of the second open/close part 800 is configured to rotate upwardly in a direction toward the location of the fan 600 when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber 111 and the freezing chamber 110 simultaneously. See, for example, Figure 4 of the present application and the corresponding disclosure. Further, the plurality of rotating plates 730 of the first open/close part 700 is configured to rotate downwardly toward the location of the fan 600 and the plurality of rotating plates 830 of the second open/close part 800 is configured to rotate downwardly in a direction opposite to the location of the fan 600 when the air is directed downwardly by the fan 600 during the defrosting so that the space is prevented from communicating with the refrigerating chamber 110 and the freezing chamber 111 simultaneously. See, for example, Figure 5 of the present application and the corresponding disclosure.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1 and 4-8 under 35 U.S.C. §103(a) over Kopko, U.S. Patent No. 6,286,326, in view of Kim et al. (hereinafter "Kim"), U.S. Patent No. 5,987,904, Chung, U.S. Patent No. 5,156,015, and Reed, U.S. Patent No. 2,191,774.

2. Claim 9 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Chung, and Reed, and further in view of Block, U.S. Patent Publication No. 2002/0192075.

3. Claim 10 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Chung, and Reed, and further in view of Carlstedt et al. (hereinafter "Carlstedt"), U.S. Patent No. 5,765,384.

4. Claim 11 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Chung, and Reed, and further in view of Schenk et al. (hereinafter "Schenk"), U.S. Patent No. 6,694,754.

5. Claim 12 under 35 U.S.C. §103(a) over Kopko, in view of Kim, Schenk, Chung, and Reed.

6. Claims 13 and 20 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Schenk, Chung, and Reed, and further in view of Carlstedt.

7. Claim 14 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Schenk, Chung, Reed, and Carlstedt, and further in view of Lindseth, U.S. Patent No. 2,000,467.

8. Claims 15 and 16 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Schenk, Chung, Reed, and Carlstedt, and further in view of Komatsu, U.S. Patent No. 5,594,585.

9. Claims 17 and 18 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Schenk, Chung, and Reed, and further in view of Kobayashi et al. (hereinafter "Kobayashi"), U.S. Patent No. 4,369,350.

10. Claim 19 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Schenk, Chung, and Reed, and further in view of Seipp et al. (hereinafter "Seipp"), U.S. Patent No. 4,369,350.

11. Claims 24-25 under 35 U.S.C. §103(a) over Kopko as modified by Kim, Schenk, Chung, and Reed.

In the section below entitled "arguments," Applicants set forth separate arguments for each of claims 1, 4-20, and 24-25. Applicants respectfully submit that each of claims 1, 4-20, and 24-25 stands and falls separately from one another.

ARGUMENT

The present application includes two independent claims, namely, independent claims 1 and 12. These claims recite different features as may be evidenced by the discussion below. However, for ease of discussion, in some instances, similar features may be discussed with respect to one another. This is not an admission that the claims are the same, or that they stand or fall together. Rather, this is an attempt to narrow the number of issues and limit the number of arguments. While arguments may be similar for different claims, it should be understood that differently claimed features are expressly recited in different claims.

103(a) Rejection over Kopko, Kim, Chung, and Reed

Independent Claim 1

Independent claim 1 recites a refrigerator, comprising a cold air duct configured to receive cold air circulating inside of a refrigerating chamber and/or a freezing chamber; an evaporator in the cold air duct; at least one defrosting heater in the cold air duct configured to selectively emit heat; a fan in the cold air duct that selectively directs the cold air in an upward or downward direction; a motor that drives the fan; and an open/close device that selectively opens and closes a space containing the evaporator, the defrosting heater, and the fan positioned therein, wherein the space communicates with both the refrigerating chamber and the freezing chamber, wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan so that the opening or closing between the space and

the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously, wherein the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space, and wherein the first and second open/close parts each comprises a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively; and a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates, wherein the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and wherein the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously. Kopko, Kim, Chung, and Reed, taken alone or in combination, fail to disclose or suggest all of such features, or the claimed combination of independent claim 1.

That is, the Office Action asserted that Kopko discloses all of the claimed features, except "a defrost heater positioned within the duct; that both the first and second open/close devices open the space to both the refrigerator and freezer compartment when the fan rotates in one direction and both the first and second open/close devices closes the space when the fan is rotated in the opposite direction; and a supporting plate having a plurality of openings, a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward from a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates." The Office Action then asserted that "Kim teaches a refrigerator (referring to figure 3) that includes an evaporator (11), a fan (15), and a defrost heater (17) disposed within a duct (illustrated in figure 3), wherein the defrost heater is selectively operated in a defrost operation (see column 1, lines 55-58)," and concluded that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Kopko to include the defrost heater as taught by Kim in order to prevent excess frost buildup on the evaporator, thus preventing the reduction in cooling efficiency due to the frost buildup."

The Office Action further stated that "[t]he general concept of designing a refrigerator to have a freezer compartment disposed above a refrigerator compartment and having airflow that flows from a space to both the refrigerator compartment and freezer compartment in series falls within the realm of common knowledge as obvious mechanical expedient and is illustrated by Chung which teaches a refrigerator (referring to figure 1) having a freezer compartment (2)

disposed above a refrigerator compartment (3) and having airflow (see arrows) that flows from a space (5) to both the refrigerator compartment and freezer compartment in series (illustrated in figure 1: via port 7), and one having ordinary skill in the art would have been motivated to include the use of a refrigerator of this configuration in order to make the refrigerator portable and fit in confined spaces." Additionally, the Office Action stated that "[c]onceptually, [it] is noted that given the refrigerator arrangement of Chung, the fan, and flaps 57 [and] 58 of Kopko would be placed in respective locations (i.e. the area of fan 6A and directly upstream of evaporator 4 where ports 9 and 9A join of Chung, in Chung." The Office Action also stated that "Reed teaches a vane assembly (referring to figure 1) that includes a plurality of vanes (11) disposed downstream of a vent (1) and connected to a tie rod (14) via an axis (12) and a lever (13)[,] wherein openings between the vanes are created when a predetermined amount of air is sucked through the vanes (illustrated in figure 1 and see column 2, lines 37-55), and when the vanes are closed, a portion of the vanes can lie onto an adjacent vane (see column 3, lines 51-65)," and that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the flaps of Kopko as modified by Kim and Chung to include the vane assembly as taught by Reed in order to provide increased directing of airflow, thus reducing air turbulence within the duct."

However, Kopko discloses a refrigerator including a freezer compartment 55, a fresh food compartment 56, an evaporator 52 disposed within a duct 59, and a reversing fan 51 that moves air over the evaporator 52, to the left or right in Fig. 2 depending on its direction of rotation. When the reversing fan 51 blows air to the left, flaps 53 and 54 open and flaps 57 and 58 close,

allowing air to circulate through the freezer compartment 55. When the reversing fan 51 blows air to the right, flaps 57 and 58 open and flaps 53 and 54 close, allowing air to circulate through the fresh food compartment 56. Thus, Kopko fails to disclose or suggest at least one defrosting heater in the cold air duct configured to selectively emit heat; a fan in the cold air duct that selectively directs the cold air in an upward or downward direction; and an open/close device that selectively opens and closes a space containing the evaporator, the defrosting heater, and the fan positioned therein, wherein the space communicates with both the refrigerating chamber and the freezing chamber, wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously, wherein the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space, and wherein the first and second open/close parts each comprises a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively; and a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates, wherein the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is

directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and wherein the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

Further, Kopko functions significantly differently from the claimed refrigerator. In Kopko, either the flaps 53 and 54 open and the flaps 57 and 58 close, allowing air to circulate through the freezer compartment 55, or the flaps 57 and 58 open and the flaps 53 and 54 close, allowing air to circulate through the fresh food compartment 56, based on the direction of rotation of the reversing fan 51. In contrast, with the claimed features, the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed

downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

Furthermore, reorienting the Kopko apparatus as proposed by the Examiner would destroy the intended function of the Kopko apparatus of selectively circulating air through the freezer compartment 55 or the fresh food compartment 56.

Kim fails to overcome the deficiencies of Kopko, as it is merely cited for allegedly teaching a heater 17 within a duct. Further, Kopko and Kim, taken alone or in combination, fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting via first and second open/close parts.

Chung fails to overcome the deficiencies of Kopko and Kim, as it is merely cited as allegedly teaching a refrigerator having a freezer compartment disposed above a refrigerator compartment and having airflow that flows from a space to both the refrigerator compartment and freezer compartment in series. Kopko, Kim, and Chung, taken alone or in combination, also fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting via first and second open/close parts.

Reed fails to overcome the deficiencies of Kopko, Kim, and Chung. That is, Reed merely teaches a suitable framework 10 mounted over a vent 1. A plurality of louvre vanes 11

are provided arranged parallel to each other and pivotally supported upon a horizontal shaft or axis 12. Further, Reed does not disclose or suggest a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively, or a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle.

Furthermore, Kopko, Kim, Chung, and Reed, taken alone or in combination, also fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting via first and second open/close parts.

Finally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of independent claim 1 over Kopko, Kim, Chung, and Reed should be reversed.

Dependent Claim 4

Dependent claim 4 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features.

Further, dependent claim 4 recites the refrigerator as claimed in claim 1, wherein each rotating plate comprises a thin plate that is rotated upward by a predetermined angle to open a respective opening of the plurality of openings. Kopko, Kim, Chung, and Reed, taken alone or in combination, fail to disclose or suggest such features.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 4 over Kopko, Kim, Chung, and Reed should be reversed.

Dependent Claim 5

Dependent claim 5 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features.

Further, dependent claim 5 recites the refrigerator as claimed in claim 1, wherein at least one of the rotating plates covers an upper circumference of the respective opening to close the opening. Kopko, Kim, Chung, and Reed, taken alone or in combination, fail to disclose or suggest such features.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 5 over Kopko, Kim, Chung, and Reed should be reversed.

Dependent Claim 6

Dependent claim 6 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features.

Further, dependent claim 6 recites the refrigerator as claimed in claim 1, wherein at least one of the rotating plates is held by a rear end of an adjacent rotating plate and the supporting

plate, to prevent the rotating plate from rotating downward. Kopko, Kim, Chung, and Reed, taken alone or in combination, fail to disclose or suggest such features.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 6 over Kopko, Kim, Chung, and Reed should be reversed.

Dependent Claim 7

Dependent claim 7 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features.

Further, dependent claim 7 recites the refrigerator as claimed in claim 1, wherein the fan is positioned over the evaporator. Kopko, Kim, Chung, and Reed, taken alone or in combination, fail to disclose or suggest such features.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 7 over Kopko, Kim, Chung, and Reed should be reversed.

Dependent Claim 8

Dependent claim 8 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features.

Further, dependent claim 8 recites the refrigerator as claimed in claim 1, wherein the defrosting heater is positioned between the fan and the evaporator. Kopko, Kim, Chung, and Reed, taken alone or in combination, fail to disclose or suggest such features.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 8 over Kopko, Kim, Chung, and Reed should be reversed.

103(a) Rejection of Dependent Claim 9 over Kopko, Kim, Chung, Reed, and Block

Dependent claim 9 recites the refrigerator as claimed in claim 1, wherein the defrosting heater is fabricated as one unit with the fan.

Dependent claim 9 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features. Block fails to overcome the deficiencies of Kopko, Kim, Chung, and Reed, as it is merely cited for allegedly teaching a defrost heater fabricated as one unit with the fan.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 9 over Kopko, Kim, Chung, Reed, and Block should be reversed.

103(a) Rejection of Dependent Claim 10 over Kopko, Kim, Chung, Reed, and Carlstedt

Dependent claim 10 recites the refrigerator as claimed in claim 1, wherein the defrosting heater comprises a hot wire that functions as a resistance body connected to a power source for emission of heat, and a film of an electrical insulating material surrounding the hot wire.

Dependent claim 10 is allowable over Kopko, Kim, Chung, and Reed at least for the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features. Carlstedt fails to overcome the deficiencies of Kopko, Kim, Chung, and Reed, as it is merely cited for allegedly teaching a hot wire that functions as a resistance body connected to a power source for emission of heat, and a film of an electrical insulating material surrounding the hot wire.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 10 over Kopko, Kim, Chung, Reed, and Carlstedt should be reversed.

103(a) rejection of Dependent Claim 11 over Kopko, Kim, Chung, Reed, (Carlstedt), and Schenk

Dependent claim 11 recites the refrigerator as claimed in claim 10, wherein the evaporator comprises at least one refrigerant pipe configured to receive a refrigerant that flows therethrough, and a plurality of fins in contact with the at least one refrigerant pipe.

Dependent claim 11 is allowable over Kopko, Kim, Chung, and Reed (and Carlstedt) at least for the reasons discussed above with respect to claims 1 and 10, from which it depends, as well as for its added features. Schenk fails to overcome the deficiencies of Kopko, Kim, Chung, and Reed (and Carlstedt), as it is merely cited for allegedly teaching a plurality of fins in contact with the refrigerant pipe.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 11 over Kopko, Kim, Chung, Reed, (Carlstedt,) and Schenk should be reversed.

103(a) Rejection of Independent Claim 12 over Kopko, Kim, Schenk, and Chung

Independent claim 12 recites a refrigerator, comprising a cold air duct configured to receive cold air circulating inside of a refrigerating chamber and a freezing chamber; an evaporator disposed in the cold air duct, the evaporator comprising at least one refrigerant pipe configured to receive a refrigerant that flows therethrough, and a plurality of fins in contact with

the at least one refrigerant pipe; at least one defrosting heater in contact with one or more of the plurality of fins for selective emission of heat; an open/close device provided at an upper portion and a lower portion of a space containing the evaporator and the defrosting heater positioned therein, that opens and closes the space; a fan in the space that selectively directs the cold air in an upward or downward direction; and a motor that drives the fan, wherein the space communicates with both the refrigerating chamber and the freezing chamber, wherein the open/close device is configured to be rotated so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously, and wherein the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space, and wherein the first and second open/close parts each comprises a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively; and a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates, wherein the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and wherein the plurality of

rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously. Kopko, Kim, Schenk, and Chung, taken alone or in combination, fail to disclose or suggest all of such features, or the claimed combination of independent claim 12.

The Office Action asserted that Kopko discloses all of the claimed features except "a defrost heater positioned within the duct; that both the first and second open/close devices open the space to both the refrigerator and freezer compartment when the fan rotates in one direction and both the first and second open/close devices closes the space when the fan is rotated in the opposite direction; and a supporting plate having a plurality of openings, a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates." The Office Action then asserted that "Kim teaches a refrigerator (referring to figure 3) that includes an evaporator (11), a fan (15), and a defrost heater (17) disposed within a duct (illustrated in figure 3), wherein the defrost heater is selectively operated in a defrost operation (see column 1, lines 55-58)" and concluded that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Kopko to include the defrost heater as taught by Kim in order to

prevent excess frost buildup on the evaporator, thus preventing the reduction in cooling efficiency due to the frost buildup." The Office Action then stated that "Schenk teaches a refrigerator (referring to figure 1) that includes an evaporator (30) having fins disposed around the refrigerant pipe (illustrated in figure 1), and concluded that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the evaporator of Kopko as modified by Kim to include the fins as taught by Schenk in order to increase heat transfer between the refrigerant and the air passing through the evaporator, thus increasing cooling efficiency."

The Office Action further stated that "[t]he general concept of designing a refrigerator to have a freezer compartment disposed above a refrigerator compartment and having airflow that flows from a space to both the refrigerator compartment and freezer compartment in series falls within the realm of common knowledge as obvious mechanical expedient and is illustrated by Chung which teaches a refrigerator (referring to figure 1) having a freezer compartment (2) disposed above a refrigerator compartment (3) and having airflow (see arrows) that flows from a space (5) to both the refrigerator compartment and freezer compartment in series (illustrated in figure 1: via port 7)," and "one having ordinary skill in the art would have been motivated to include the use of a refrigerator of this configuration in order to make the refrigerator portable and fit in confined spaces." Additionally, the Office Action stated that "[c]onceptually, [it] is noted that given the refrigerator arrangement of Chung, the fan, and flaps 57 [and] 58 of Kopko would be placed in respective locations (i.e. the area of fan 6A and directly upstream of evaporator 4 where ports 9 and 9A join of Chung) in Chung." The Office Action also stated

that "Reed teaches a vane assembly (referring to figure 1) that includes a plurality of vanes (11) disposed downstream of a vent (1) and connected to a tie rod (14) via an axis (12) and a lever (13)[,] wherein openings between the vanes are created when a predetermined amount of air is sucked through the vanes (illustrated in figure 1 and see column 2, lines 37-55), and when the vanes are closed, a portion of the vanes can lie onto an adjacent vane (see column 3, lines 51-65," and that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the flaps of Kopko as modified by Kim, Schenk and Chung to include the vane assembly as taught by Reed in order to provide increased directing of airflow, thus reducing air turbulence within the duct."

However, as indicated, Kopko discloses a refrigerator including a freezer compartment 55, a fresh food compartment 56, an evaporator 52 disposed within a duct 59, and a reversing fan 51 that moves air over the evaporator 52, to the left or right in Fig. 2 depending on its direction of rotating. When the reversing fan 51 blows air to the left, flaps 53 and 54 open and flaps 57 and 58 close, allowing air to circulate through the freezer compartment 55. When the reversing fan 51 blows air to the right, flaps 57 and 58 open and flaps 53 and 54 close, allowing air to circulate through the fresh food compartment 56. Thus, Kopko fails to disclose or suggest an evaporator disposed in the cold air duct, the evaporator comprising at least one refrigerant pipe configured to receive a refrigerant that flows therethrough, and a plurality of fins in contact with the at least one refrigerant pipe; at least one defrosting heater in contact with one or more of the plurality of fins for selective emission of heat; an open/close device provided at an upper portion and a lower portion of a space containing the evaporator and the defrosting heater positioned therein,

that opens and closes the space; and wherein the space communicates with both the refrigerating chamber and the freezing chamber, wherein the open/close device is configured to be rotated so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously, and wherein the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space, and wherein the first and second open/close parts each comprises a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively; and a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates, wherein the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and wherein the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is

prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

Further, Kopko functions significantly differently from the claimed refrigerator. In Kopko, either the flaps 53 and 54 open and the flaps 57 and 58 close, allowing air to circulate through the freezer compartment 55, or the flaps 57 and 58 open and the flaps 53 and 54 close, allowing air to circulate through the fresh food compartment 56 based on the direction of rotation of the reversing fan 51. In contrast, with the claimed features, the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

Furthermore, reorienting the Kopko apparatus as proposed by the Examiner would destroy the intended function of the Kopko apparatus of selectively circulating air through the freezer compartment 55 or the fresh food compartment 56.

Kim fails to overcome the deficiencies of Kopko, as it is merely cited for allegedly teaching a heater 17 within a duct. However, Kopko and Kim, taken alone or in combination fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting via first and second open/close parts.

Schenk fails to overcome the deficiencies of Kopko and Kim, as it is merely cited for allegedly teaching an evaporator with fins. Kopko, Kim, and Schenk, taken alone or in combination fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a

direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting via first and second open/close parts.

Chung fails to overcome the deficiencies of Kopko, Kim, and Schenk, as it is merely cited as allegedly teaching a refrigerator having a freezer compartment disposed above a refrigerator compartment and having airflow that flows from a space to both the refrigerator compartment and freezer compartment in series. Kopko, Kim, Schenk, and Chung, taken alone or in combination fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber

simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting via first and second open/close parts.

Reed fails to overcome the deficiencies of Kopko, Kim, Schenk, and Chung. That is, Reed merely teaches a suitable framework 10 mounted over a vent 1. A plurality of louvre vanes 11 are provided arranged parallel to each other and pivotally supported upon a horizontal shaft or axis 12. Further, Reed does not disclose or suggest a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively, or a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle.

Furthermore, Kopko, Kim, Schenk, Chung, and Reed , taken alone or in combination fails to disclose or suggest the plurality of rotating plates of the first open/close part configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part configured to rotate upwardly in a direction toward the

location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and the plurality of rotating plates of the first open/close part configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously, or the concept of allowing communication of a space containing an evaporator, defrosting heater, and fan with a refrigerating chamber and a freezing chamber during cooling via first and second open/close parts and preventing communication of the space with the refrigerating chamber and freezing chamber during defrosting.

Finally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of independent claim 12 over Kopko, Kim, Schenk, and Chung should be reversed.

103(a) Rejection of Dependent Claims 13 and 20 over Kopko, Kim, Schenk, Chung, Reed, and Carlstedt

Dependent claim 13 recites the refrigerator as claimed in claim 12, wherein the defrosting heater comprises a hot wire that functions as a resistance body connected to a power source for

emission of heat, and a film of an electrical insulating material surrounding the hot wire. Dependent claim 20 recites the refrigerator as claimed in claim 12, wherein at least a portion of the plurality of fins have insertion slots in side surfaces configured to receive the defrosting heater.

Dependent claims 13 and 20 are allowable over Kopko, Kim, Schenk, Chung, and Reed at least for the reasons discussed above with respect to independent claim 12, from which they depend, as well as for their added features. Carlstedt fails to overcome the deficiencies of Kopko, Kim, Schenk, Chung, and Reed, as it is merely cited for allegedly teaching a hot wire that functions as a resistance body connected to a power source for emission of heat, a film of an electrical insulating material surrounding the hot wire, and wherein at least a portion of the plurality of fins have insertion slots in side surfaces configured to receive the defrost heater.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claims 13 and 20 over Kopko, Kim, Schenk, Chung, Reed, and Carlstedt should be reversed.

103(a) Rejection of Dependent Claim 14 over Kopko, Kim, Schenk, Chung, Reed, Carlstedt, and Lindseth

Dependent claim 14 recites the refrigerator as claimed in claim 13, wherein the hot wire is a bent carbon hot wire.

Dependent claim 14 is allowable over Kopko, Kim, Schenk, Chung, Reed, and Carlstedt at least for the reasons discussed above with respect to claim 13, from which it depends, as well as for its added features. Lindseth fails to overcome the deficiencies of Kopko, Kim, Schenk, Chung, Reed, and Carlstedt as it is merely cited for allegedly teaching that the hot wire is a carbon hot wire.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 14 over Kopko, Kim, Schenk, Chung, Reed, Carlstedt, and Lindseth should be reversed.

103(a) Rejection of Dependent Claims 15 and 16 over Kopko, Kim, Schenk, Chung, Reed, Carlstedt, and Komatsu

Dependent claim 15 recites the refrigerator as claimed in claim 13, wherein the film is formed of PET material. Dependent claim 16 recites the refrigerator as claimed in claim 12, wherein the defrosting heater is a PTC device.

Dependent claims 15 and 16 are allowable over Kopko, Kim, Schenk, Chung, Reed, and Carlstedt at least for the reasons discussed above with respect to claims 12 and 13, from which they respectively depend, as well as for their added features. Komatsu fails to overcome the deficiencies of Kopko, Kim, Schenk, Chung, Reed, and Carlstedt, as it is merely cited for

allegedly teaching that the film is formed of PET material and wherein the defrosting heater is a PTC device.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claims 15 and 16 over Kopko, Kim, Schenk, Chung, Reed, Carlstedt, and Komatsu should be reversed.

103(a) Rejection of Dependent Claims 17 and 18 over Kopko, Kim, Schenk, Chung, Reed, and Kobayashi

Dependent claim 17 recites the refrigerator as claimed in claim 12, wherein the defrosting heater is attached to a surface of at least one of the plurality of fins. Dependent claim 18 recites the refrigerator as claimed in claim 12, wherein the defrosting heater is attached to one side of the plurality of fins.

Dependent claims 17 and 18 are allowable over Kopko, Kim, Schenk, Chung, and Reed at least for the reasons discussed above with respect to independent claim 12, from which they depend, as well as for their added features. Kobayashi fails to overcome the deficiencies of Kopko, Kim, Schenk, Chung, and Reed, as it is merely cited for allegedly teaching that the defrost heater is attached to at least one side of the plurality of fins.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claims 17 and 18 over Kopko, Kim, Schenk, Chung, Reed, and Kobayashi should be reversed.

103(a) Rejection of Dependent Claim 19 over Kopko, Kim, Schenk, Chung, Reed, and Seipp

Dependent claim 19 recites the refrigerator as claimed in claim 12, wherein the defrosting heater has pass through holes for the at least one refrigerant pipe.

Dependent claim 19 is allowable over Kopko, Kim, Schenk, Chung, and Reed at least for the reasons discussed above with respect to independent claim 12, from which it depends, as well as for its added features. Seipp fails to overcome the deficiencies of Kopko, Kim, Schenk, Chung, Reed, as it is merely cited for allegedly teaching that the defrost heater has pass through holes for the at least one refrigerant pipe.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claim 19 over Kopko, Kim, Schenk, Chung, Reed, and Seipp should be reversed.

103(a) Rejection of Dependent Claims 24-25 over Kopko, Kim, Schenk, Chung, and Reed

Dependent claim 24 recites the refrigerator as claimed in claim 12, wherein at least one of the rotating plates comprises a thin plate that is rotated upward by a predetermined angle to open a respective opening of the plurality of openings. Dependent claim 25 recites the refrigerator as claimed in claim 12, wherein at least one of the rotating plates covers an upper circumference of the respective opening to close the opening.

Dependent claims 24-25 are allowable over Kopko, Kim, Schenk, Chung, and Reed at least for the reasons discussed above with respect to independent claim 12, from which they depend, as well as for their added features. Further, as discussed above, Reed fails to disclose or suggest wherein at least one of the rotating plates comprises a thin plate that is rotated upward by a predetermined angle to open a respective opening of the plurality of openings, or wherein at least one of the rotating plates covers an upper circumference of the respective opening to close the opening.

Additionally, the fact that multiple (four, five, six, and even seven) references were required to reject the claims is clear evidence that the Examiner's proposed combinations are based on impermissible hindsight gleaned from Applicants' own disclosure.

For at least these reasons, the rejection of dependent claims 24-25 over Kopko, Kim, Schenk, Chung, and Reed should be reversed.

CLAIMS APPENDIX

The attached Claims Appendix contains a copy of the claims involved in the appeal.

EVIDENCE APPENDIX

Applicants have not provided any evidence with this appeal.

RELATED PROCEEDINGS APPENDIX

Applicants are not providing copies of related decisions.

CONCLUSION

It is respectfully submitted that the above arguments show that each of claims 1, 4-20, and 24-25 are patentable over the applied references. Based at least on these reasons, it is respectfully submitted that each of claims 1, 4-20, and 24-25 defines patentable subject matter. Applicants respectfully request that the rejections of claims 1, 4-20, and 24-25 set forth in the Final Office Action be reversed.

Respectfully submitted,
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CLAIMS APPENDIX

1. A refrigerator, comprising:

a cold air duct configured to receive cold air circulating inside of a refrigerating chamber and/or a freezing chamber;

an evaporator in the cold air duct;

at least one defrosting heater in the cold air duct configured to selectively emit heat;

a fan in the cold air duct that selectively directs the cold air in an upward or downward direction;

a motor that drives the fan; and

an open/close device that selectively opens and closes a space containing the evaporator, the defrosting heater, and the fan positioned therein, wherein the space communicates with both the refrigerating chamber and the freezing chamber, wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously, wherein the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space, and wherein the first and second open/close parts each comprises:

a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively; and

a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates, wherein the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and wherein the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

4. The refrigerator as claimed in claim 1, wherein each rotating plate comprises a thin plate that is rotated upward by a predetermined angle to open a respective opening of the plurality of openings.

5. The refrigerator as claimed in claim 1, wherein at least one of the rotating plates covers an upper circumference of the respective opening to close the opening.

6. The refrigerator as claimed in claim 1, wherein at least one of the rotating plates is held by a rear end of an adjacent rotating plate and the supporting plate, to prevent the rotating plate from rotating downward.

7. The refrigerator as claimed in claim 1, wherein the fan is positioned over the evaporator.

8. The refrigerator as claimed in claim 1, wherein the defrosting heater is positioned between the fan and the evaporator.

9. The refrigerator as claimed in claim 1, wherein the defrosting heater is fabricated as one unit with the fan.

10. The refrigerator as claimed in claim 1, wherein the defrosting heater comprises:

a hot wire that functions as a resistance body connected to a power source for emission of heat; and

a film of an electrical insulating material surrounding the hot wire.

11. The refrigerator as claimed in claim 10, wherein the evaporator comprises:

at least one refrigerant pipe configured to receive a refrigerant that flows therethrough; and

a plurality of fins in contact with the at least one refrigerant pipe.

12. A refrigerator, comprising:

a cold air duct configured to receive cold air circulating inside of a refrigerating chamber and a freezing chamber;

an evaporator disposed in the cold air duct, the evaporator comprising at least one refrigerant pipe configured to receive a refrigerant that flows therethrough, and a plurality of fins in contact with the at least one refrigerant pipe;

at least one defrosting heater in contact with one or more of the plurality of fins for selective emission of heat;

an open/close device provided at an upper portion and a lower portion of a space containing the evaporator and the defrosting heater positioned therein, that opens and closes the space;

a fan in the space that selectively directs the cold air in an upward or downward direction; and

a motor that drives the fan, wherein the space communicates with both the refrigerating chamber and the freezing chamber, wherein the open/close device is configured to be rotated so

that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device simultaneously, and wherein the open/close device comprises a first open/close part on an upper side of the space and a second open/close part on a lower side of the space, and wherein the first and second open/close parts each comprises:

a supporting plate having a plurality of openings, the supporting plate being arranged above or below the fan and the evaporator, respectively; and

a plurality of rotating plates, each having one side coupled to the supporting plate by hinges, and the other side being rotatable upward by a predetermined angle, wherein each of the plurality of rotating plates is independently coupled to the supporting plate without a connection to others of the plurality of rotating plates, wherein the plurality of rotating plates of the first open/close part is configured to rotate upwardly in a direction opposite to a location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate upwardly in a direction toward the location of the fan when the air is directed upwardly by the fan during cooling so that the space communicates with the refrigerating chamber and the freezing chamber simultaneously, and wherein the plurality of rotating plates of the first open/close part is configured to rotate downwardly toward the location of the fan and the plurality of rotating plates of the second open/close part is configured to rotate downwardly in a direction opposite to the location of the fan when the air is directed downwardly by the fan

during the defrosting so that the space is prevented from communicating with the refrigerating chamber and the freezing chamber simultaneously.

13. The refrigerator as claimed in claim 12, wherein the defrosting heater comprises:

a hot wire that functions as a resistance body connected to a power source for emission of heat; and

a film of an electrical insulating material surrounding the hot wire.

14. The refrigerator as claimed in claim 13, wherein the hot wire is a bent carbon hot wire.

15. The refrigerator as claimed in claim 13, wherein the film is formed of PET material.

16. The refrigerator as claimed in claim 12, wherein the defrosting heater is a PTC device.

17. The refrigerator as claimed in claim 12, wherein the defrosting heater is attached to a surface of at least one of the plurality of fins.

18. The refrigerator as claimed in claim 12, wherein the defrosting heater is attached to one side of the plurality of fins.

19. The refrigerator as claimed in claim 12, wherein the defrosting heater has pass through holes for the at least one refrigerant pipe.

20. The refrigerator as claimed in claim 12, wherein at least a portion of the plurality of fins have insertion slots in side surfaces configured to receive the defrosting heater.

24. The refrigerator as claimed in claim 12, wherein at least one of the rotating plates comprises a thin plate that is rotated upward by a predetermined angle to open a respective opening of the plurality of openings.

25. The refrigerator as claimed in claim 12, wherein at least one of the rotating plates covers an upper circumference of the respective opening to close the opening.

RELATED APPEALS AND INTERFERENCES APPENDIX

None provided.

EVIDENCE APPENDIX

None provided.